Gender, Age, Social Level and Cardiovascular Risk Factors: Considerations on the Brazilian Reality

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Recent data show a decrease in U.S. deaths from coronary artery disease (CAD). Almost 150,000 deaths (approximately 44% of the total) between 1980 and 2000 are estimated to have been prevented thanks to the control of risk factors (RF) such as hypercholesterolemia, systolic hypertension, smoking and sedentary lifestyle[1]. Based on data from the AFIRMAR study, we can also verify that most of the RF for AMI in Brazil are preventable[2].

The association between the presence of RF from adolescence through middle age and the presence of coronary atherosclerotic plaques later in life has also been demonstrated. Likewise, the early control of RF also seems to positively affect further development of CAD[3]. Therefore, diagnosing and combating these factors is of the utmost importance from a public health standpoint, in order to tackle deaths from cardiovascular diseases (CVD) in Brazil. According to the most recent data from the Ministry of Health, CVD account for a large proportion of deaths in Brazil, corresponding to 31% of the total, and are proportionally higher among women in relation to men. If only the age range from 40 years and older is considered, this proportion corresponds to almost the sum of the three subsequent causes (neoplasia, respiratory and external causes)[4]. In relation to the world situation, 2/3 of the CVD deaths are estimated to occur in developing countries such as Brazil, corresponding to double the amount found in developed countries[5]. Additionally, CAD have been demonstrated to have a high cost both for the public and the private sectors, and comparatively higher than in developed countries[6]. In this manuscript, we discuss the findings from some Brazilian observational studies that can have implications on preventive strategies.

There is a great influence of biological and social factors on the risk profile of individuals, and this can lead to a higher incidence of CVD in some segments of the society[3]. In a study of 343 school children, we verified a probable influence of the social class on lipid profile. Statistically significant differences were found for mean cholesterol levels of school children from private schools (171 mg/dL) in comparison to those of school children from public/philanthropic schools (136mg/dL) for both genders, and also for LDL[7]. Based on these results, it was hypothesized that children from a lower socioeconomic class "could be relatively protected by this fact", perhaps because the food available to them is more dependent on the school lunch, which is supervised by nutritionists, and possibly because they practice more physical activities while playing. They also probably walk more, which results in more intense and constant activity in comparison to their peers, who most frequently use cars or public transportation.

Following the line of primary prevention, we assessed the presence of RF in the female gender[8]. For this purpose, 419 women were interviewed. Of these, 97 were elderly women from a nursing home, 98 were university students, 99 were physicians, and 125 were cleaners working in hospitals. The mean age was 43 years, higher than when the group of postmenopausal women was excluded. Blood pressure was taken and cholesterol was determined. As expected, the older women had a higher prevalence of cardiovascular RF such as hypertension, diabetes, obesity, and hypercholesterolemia (Table 1). However, it was among the cleaners that we found the most significant alterations, although their age range was similar to that of the physicians and university students. In this group, cholesterol levels higher than 200 mg/dL and the presence of hypertension were similar to those found in the elderly; however, smoking, obesity and sedentary lifestyle were more prevalent in relation to the other groups, and diabetes only in relation to the group of physicians and university students. Thus, we came to the conclusion that the socioeconomic level probably had a negative influence on the presence of RF for CVD. In the case of underprivileged children, we can speculate that the poverty condition leads them to a better risk profile for heart diseases. When they grow up, however, they have some possibility to make decisions in relation to their life habits. This fact, associated with lack of information, makes them lose that initial protection and start to face a higher risk[8]. This is, therefore, another group that requires early intervention.

In the case of individuals who developed CAD at an early age, a retrospective analysis of 236 patients 17 to 45 years of age[9] (mean of 38 years), of whom 80% were men and 58% had a history of acute myocardial infarction, showed that 80% had three or more RF and 58%, four or more. When subjective factors such as stress, sedentary lifestyle and obesity were excluded, 88% had three or more RF. The most prevalent alterations were smoking (75%), sedentary lifestyle (65%), and positive family history (60%). The most frequent RF associations were observed

Key Words

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between smoking and diabetes, and between smoking and hypercholesterolemia[10]. Among those who develop CAD at an early age, it seems that the assessment is easier because of the presence of several RF in the same patient, which permits a possibly more efficient primary prevention. We should remember that CAD in this group is usually more severe due to the rapid progression of atherosclerosis and its preferential localization in the anterior descending artery in 67% of 114 patients hospitalized with history of ACS[10].

With the purpose of including a greater number of patients from a wider age range, we conducted a cross-sectional evaluation of a population of 2337 coronary patients treated on an outpatient basis, with ages ranging from 26 to 89 years, of whom 61% were men[11]. In this sample, we found a higher prevalence of RF among women. Likewise, the prevalence of individuals with three or more RF was also higher among women (Table 2). When individuals aged 55 years or younger were compared to those aged 65 years or older, we verified a significantly higher frequency of family history, former smoking, obesity, current smoking, and presence of three or more risk factors in the first group (Table 3)[12].

When these data are analyzed together, it seems that adults with lower economic power have a higher cardiovascular risk due to the higher prevalence of RF, which does not occur during childhood. We can conclude that, in this case, better information/education could influence and modify this situation. In relation to gender and age, it seems easier to identify those who are more likely to develop

Table 1 - Prevalence of risk factors in women.

	Elderly (n=97)	University students (n=98)	Physicians (n=99)	Cleaners (n=125)	P
Smoking	10%	25%	8%	28%	<0.001
Hypertension	39%	1%	6%	20%	<0.001
Obesity	43%	13%	17%	54%	<0.001
Cholesterol >200 mg%	28%	14%	16%	21%	0.073
Diabetes	15%	2%	2%	6%	<0.001
Stress	52%	45%	70%	58%	0.003
Menopause	100%	9%	13%	30%	<0.001
Sedentary lifestyle	81%	71%	73%	88%	0.0061

Statistical tests used: chi square test and Student's t test

Table 2 - Prevalence of risk factors by gender

	Women %	Men %	P
Hypertension	73	54	< 0.0001
Family history	59	50	< 0.0001
Former smoking	30	50	< 0.0001
Dyslipidemia	54	44	< 0.0001
Sedentary lifestyle	55	42	< 0.0001
Diabetes	24	20	0.026
Obesity	22	10	< 0.0001
Smoking	9	11	0.10
Peripheral vascular disease	1	2	0.51
> 2 risk factors	63	41	< 0.0001

Student's t test for independent samples or Mann-Whitney test

Table 3 - Prevalence of risk factors by age range.

	Age < 55 years %	Age > 65 years %	
Family History	58	46	0.005
Former smoking	56	46	0.028
Obesity	15	8	0.008
Smoking	15	5	< 0.0001
Hypertension	56	56	0.93
Dyslipidemia	51	52	0.77
Sedentary lifestyle	47	42	0.45
Diabetes	20	22	0.59
Peripheral cascular disease	3	2	few cases
> 2 risk factors	51	42	0.049

Student's t test for independent samples or Mann-Whitney test

atherosclerosis by considering the greater accumulation of RF among women and younger individuals. We should remember that these are the groups with the worst outcome when presenting CAD.

Studies have demonstrated the benefits of RF control, as is the case of Ciorlia and Godoy's study[13] with follow-up of up to 20 years. In this context, we can conclude that there is a high possibility of changing the incidence of, and perhaps mortality from, CAD using awareness and prevention campaigns, such as those for breast cancer, dengue and AIDS.

Potential Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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Study Association

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